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"Bulletproof skeptics in life's jungle": which self-exempting beliefs about smoking most predict lack of progression towards quitting?

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Abstract

Objective. To determine the prevalence, correlates, and predictive value for intention to quit of 18 commonly expressed self-exempting beliefs about smoking among smokers and recent quitters, some 20 years after intensive tobacco control commenced in Australia.

Method. National telephone survey of randomly selected 802 adults (685 smokers; 117 recent quitters).

Main outcome measures. Level of agreement or disagreement with 18 self-exempting beliefs about smoking and intention to quit.

Results. Four coherent categories of self-exempting beliefs are widely held by smokers ("bulletproof", "skeptic", "jungle", and "worth it"). Smokers who hold self-exempting beliefs are more likely to be aged over 50, smoke more than 15 cigarettes per day, have less than 12 years of schooling, and be in the precontemplation stage of change. All scales had some relationship with progress towards quitting. In particular, "worth it" beliefs are powerful independent predictors of smokers not planning to quit.

Conclusions. Some self-exempting beliefs seem to act as a shield for smokers, giving them false reassurance and allowing them to avoid thinking deeply about the importance of quitting. This is particularly true of "worth it" beliefs. The prevalence of such beliefs may suggest confusion about smoking being a *risk* rather than a probable cause of illness. Creative approaches to increasing the saliency of the costs of smoking may be fruitful.

Keywords: Smoking; Beliefs; Cognitive dissonance; Intention to quit

Introduction

In Australia during 1974, 45.3% of men and 29.6% of women smoked at least once per week [1]. By 2001, this had fallen to 23.1% of men and 19.3% of women (with 21.1% men and 18.0% women smoking daily) [2]. The intervening period—particularly since 1982 when the first major quit campaign commenced—saw the introduction of three generations of pack warnings (1973, 1987, 1995) [3], the elimination of all tobacco advertising, the introduction of smoke-free public transport and restaurants [4] and many workplaces [5], the deregulation of nicotine replacement therapy allowing direct to the public advertising about smoking cessation, and large-scale government sponsored public awareness campaigns [6]. In addition, these measures have all generated widespread community debate and news coverage that has been overwhelmingly negative to smoking [7].

Australia has one of the most comprehensive and robust tobacco control programs in the world, yet around one in five of the population aged 14 and over still smoke daily [8]. This presents a significant challenge to tobacco control policy, as many of its traditional platforms have already been implemented in Australia. Discussion about the potential for "paradigm shifts" in the focus of communication about smoking and health are common among Australian tobacco control workers.

To date, appeals to smokers to consider quitting have been dominated by messages highlighting the health consequences of smoking, with occasional efforts targeting the growing social unacceptability of smoking, its cost and strategies for quitting and avoiding relapse. One area postulated to hold potential to further erode smoking is to design communicative interventions that take account of the various ways that many smokers rationalize their smoking. In communicative environments like Australia where considerable effort has been expended trying to

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make the risks of smoking seem more personally relevant, it may be that efforts to undermine or psychologically "inoculate" [9] against these rationalizations could prove fruitful.

In 1957, Festinger [10] hypothesized that smoking in the face of information about its health effects creates cognitive dissonance that smokers must dissipate through mediating beliefs or rationalizations. In 1991, Chapman et al. [11] found that Australian smokers were more likely than ex-smokers to hold self-exempting beliefs about smoking that might act to dissipate cognitive dissonance. Subsequent studies have shown that such beliefs are common among smokers. Despite often near universal awareness of claims made about smoking being harmful to health, many smokers remain skeptical about these claims and the level of risk associated with smoking [12,13].

In this paper, we report on a survey that extends the 1991 study, following a decade of intensive tobacco control in Australia when adult smoking prevalence fell from 26.0% to 21.2% [2,14]. We report on a national survey of smokers and recent quitters undertaken in 2002 examining the prevalence and correlates of 18 self-exempting beliefs precategorized into three broad types:

1. Beliefs suggesting smokers think they have some personal immunity to the health effects of smoking—"bulletproof" beliefs
2. Beliefs indicating smokers do not believe medical evidence about smoking and disease—"skeptic" beliefs
3. Beliefs normalizing the dangers of smoking because of the ubiquity of risks ("life's a jungle"')—"jungle" beliefs

It was hypothesized (a) that these beliefs would form coherent scales using factor analysis; (b) that self-exempting beliefs would be most prevalent among the older and less well educated; (c) that intention to quit would be related to each self-exempting belief scale; and (d) that the relationship would be cumulative, with greater adherence to self-exempting beliefs associated with lower intention to quit.

Method

Self-exempting beliefs measure

Self-exempting belief items were generated by participants in a closed international tobacco control email list server, Globalink, who were invited to submit examples of self- exempting statements commonly expressed by smokers. From suggestions submitted, 18 distinct self-exempting beliefs were selected, including 7 based on items from the previous paper [11]. Respondents to the community survey (see below) rated their agreement with each self-exempting belief statement from 1 to 5 (1 = totally disagree; 3 = neither agree nor disagree; 5 = totally agree). Statements were asked in rotated order for each interview to control for order effects in responding. Recent quitters were offered a selection of statements to rate that were relevant to their smoking status.

Knowledge scale

Five questions were asked to determine awareness of the hazards of smoking: whether smoking causes heart disease and lung cancer, passive smoking causes lung cancer in others; which of five risks (smoking, illegal drugs, road accidents, alcohol and suicide) caused the most deaths each year in Australia, and an estimate of the number of years smoking took off the average smoker's life (six or more was accepted as correct). Correct answers for each question were scored "1" and summed to compute a "knowledge" scale. Possible scores on this scale ranged from 0 (low knowledge) to 5 (high knowledge).

Measure of intention to quit

Intention to quit was measured by a modified version of stage of change [15] that ignored past quitting history. Smokers were asked if they planned to quit within the next 30 days (Preparation), in the next 6 months (Contemplation), or sometime/planning to smoke for the rest of my life (Precontemplation). A fourth category of intention to quit included all recent quitters, defined as having stopped smoking within the previous 12 months.

Measures of cigarette consumption and quitting history

Cigarette consumption was assessed by the question "On average, about how many cigarettes, including factory made and roll-your-own do/did you smoke per day?" Participants were grouped into heavy (15+ cigarettes per day), medium (5–14 cigarettes per day), or light (0–4 cigarettes per day) consumption. Weekly smokers (those who reported smoking at least weekly, but not daily) were grouped in the "light" category. For the main analyses, a fourth category was created for recent quitters (including all recent quitters, regardless of previous consumption).

Quitting history was assessed by the question "What was the longest time, if ever, that you have quit smoking for?" Respondents who had never quit, or quit for less than 1 day, were distinguished from those who reported a longer previous quit attempt.

Sociodemographic measures

Sociodemographic variables measured were gender, age (18–29, 30–49, 50+), level of education (less than year 12, year 12+), and income ($0–20000, $20001–40000, $40001–60000, $60001+) (Australian dollars).

Participants

A telephone survey was conducted in April 2002 by a commercial market research company. Households were randomly selected from telephone directories in metropolitan and rural Australia with the number selected in each geographical area (urban and rural) reflecting population distribution. Selection continued until the required number of respondents was contacted.

The survey identified 802 eligible respondents aged 18 years or over who were willing to be interviewed and were either current smokers (685) or recent quitters (117). Current smokers were those who reported smoking at least weekly and recent quitters were eligible if they reported smoking at least weekly in the past. Of the sample, 47.2% were male, 53.9% were aged between 18 and 39, 32.3% had completed some higher education, and 76.6% were daily smokers, 8.9% were weekly smokers, and 14.6% had quit in the previous year. Overall, 26.3% reported they smoked (or used to smoke) 25 or more cigarettes per day, and 88% of the current smokers reported previous attempts to quit that lasted for a day or more.

Data analysis

Categorical data were analyzed by cross tabulation using SPSS statistical software with significance tested by Chi-square tests. The 18 self-exempting beliefs were factor analyzed to determine if they in fact represented the three distinct constructs we had hypothesized (''bulletproof'', ''skeptic'', and ''jungle''). Analysis of variance (ANOVA) was conducted to identify whether the beliefs or belief scales were associated with intention to quit. Stepwise discriminant function analysis was used to explore the capacity of each belief or belief scale to independently predict intention to quit. A P value of $P < 0.05$ was used for statistical significance.

Results

A small group of smokers and recent quitters still claim to not believe that smoking causes lung cancer (7.6% of all respondents) and heart disease (11%), with disagreement that passive smoking causes lung cancer in others remaining widespread (29.2%). Only 49% knew smoking was the largest cause of death in Australia and 50.2% answered correctly that smokers on average lose six or more years of life. The mean of the combined knowledge scale was 3.5 out of a possible 5.

Smokers with lower knowledge scores were more likely to be older (50+), have a lower level of education, and to be heavy smokers. Differences by gender and income were not statistically significant. Knowledge of the hazards of smoking was significantly related to intention to quit [$F(3,798) = 13.33$, $P < 0.001$), with precontemplators having lower knowledge of the harms of smoking (3.20) than those in more advanced stages (contemplation = 3.79; preparation = 3.72; recent quitters = 3.74).

There was considerable agreement with the self-exempting beliefs, although only two were believed by a majority (see Table 1). A principal components analysis with promax rotation of the 18 self-exempting beliefs items supported the three hypothesized factors. However, a fourth discrete factor (labeled ''worth it'' beliefs) emerged out of the cluster of ''jungle'' beliefs. Table 1 is organized around this four-factor solution. Two items did not clearly load on any factor and/or did not add to the internal consistency of the scale to measure that factor. These were treated as separate items in the analysis. All four factors demonstrated marginal to adequate reliability (between 0.55 and 0.81). For ''bulletproof'' and ''jungle'', we also computed reliability shorter (three item) scales using the items answered by all respondents (i.e., including the recent quitters), in both cases, alpha was 0.51. As expected, all factors correlated negatively with knowledge of the harms of smoking, with the effect most marked for the ''skeptic'' scale ($r = -0.49$ for smokers).

Table 1 also shows the relationship with progress towards quitting of the four scales, the items comprising each factor, and the two remaining single items. For most items and scales, two F values are reported: the first includes recent quitters in the analysis (where applicable), the second value includes only current smokers. Levels of self-exempting beliefs were associated with progress towards quitting in the expected way for all four factors, and both single items. However, ''bulletproof'' beliefs were not related to progress among smokers. Post hoc comparisons suggested that for the ''skeptic'' and ''worth it'' scales, the largest difference was between precontemplators and contemplators, while for ''jungle'' and ''bulletproof'' beliefs, the main difference was between preparers and recent quitters.

The four scales were all moderately intercorrelated and all also correlated with the low tar item. In general, they were not closely related to the informed choice item (see Table 2).

Notes to Table 1:
ns: not significant.
For each, top value includes ex-smokers where relevant, then bottom value includes smokers only.
* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

Table 1
Self-exempting belief factors and agreement with self-exempting beliefs

Belief	Factor loading	% Agree (smokers)	Mean level of agreement				F^a
			Precontemplators	Contemplators	Preparers	Recent quitters	
Skeptic beliefs ($\alpha = 0.81$)			**2.56**	**2.18**	**2.13**	**1.96**	**18.30***** **16.63*****
Lots of doctors and nurses smoke, so it cannot be all that harmful	0.85	14.2	2.31	1.94	1.95	1.79	9.02*** 9.04***
The medical evidence that smoking is harmful is exaggerated	0.84	22.9	2.48	2.16	2.07	1.91	6.99*** 6.00**
Smoking cannot be all that bad for you because many people who smoke live long lives	0.79	23.6	2.87	2.34	2.16	1.97	23.20*** 21.93***
Smoking cannot be all that bad because some top sports people smoke and still perform well	0.59	14.6	2.35	1.97	1.95	1.74	11.66*** 10.29***
More lung cancer is caused by such things as air pollution, petrol, and diesel fumes than smoking	0.55	24.1	2.78	2.52	2.52	2.36	4.66** 4.07*
Bulletproof beliefs							
3 items (all respondents), $\alpha = 0.51$			**2.25**	**2.10**	**2.19**	**1.90**	**4.83****
5 items (smokers only), $\alpha = 0.59$			**2.28**	**2.14**	**2.18**	**N/A**	**2.09 ns**
Cancer mostly strikes people with negative attitudes	0.90	13.9	1.99	1.99	2.14	1.91	0.91 ns 0.91 ns
They will have found cures for cancer and all the other problems smoking causes before I am likely to get any of them	0.54	15.9	2.18	2.27	2.26	N/A	0.40 ns
You can overcome the harms of smoking by doing things like eating healthy food and exercising regularly	0.46	29.3	2.66	2.50	2.63	2.17	3.87** 0.90 ns
I think I must have the sort of good health or genes that means I can smoke without getting any of the harms	0.40	14.3	2.10	1.81	1.79	1.62	6.13*** 5.06**
I think I would have to smoke a lot more than I do to put my health at risk	0.27	19.3	2.45	2.15	2.06	N/A	6.09**
"Worth it" beliefs ($\alpha = 0.68$)			**3.00**	**2.20**	**2.09**	**N/A**	**45.53*****
I would rather live a shorter life and enjoy it than a longer one where I will be deprived of the pleasure of smoking	0.84	22.9	2.84	2.12	2.05	N/A	28.62***
You have got to die of something, so why not enjoy yourself and smoke	0.76	32.7	3.16	2.28	2.13	N/A	38.62***
Jungle beliefs							
3 items (all respondents), $\alpha = 0.51$			**2.97**	**2.79**	**2.70**	**2.38**	**11.20*****
4 items (smokers only), $\alpha = 0.55$			**3.09**	**2.96**	**2.87**	**N/A**	**3.36***
Everything causes cancer these days	0.62	40.6	3.16	2.94	2.85	2.42	9.25*** 3.17*
If smoking was so bad for you, the government would ban tobacco sales	0.56	27.3	2.32	2.44	2.35	2.13	1.10 ns 0.38 ns
It is dangerous to walk across the street	0.56	55.8	3.47	3.46	3.39	N/A	0.20 ns
Smoking is no more risky than lots of other things that people do	0.45	45.8	3.42	3.00	2.90	2.59	14.01*** 10.70***
Single items (did not load on any factor)							
I have made an informed choice to smoke in full knowledge of the risks I am taking		80.9	4.27	4.12	3.93	N/A	4.24*
It's not really dangerous to smoke low-tar cigarettes		7.9	1.97	1.77	1.75	1.49	7.37*** 3.51*

Table 2
Correlations between key variables (all cases above the diagonal, smokers only below)

	1	2	3	4	5	6	7
1 Knowledge	–	−0.49*	−0.26*	na	−0.32*	na	−0.25*
2 Skeptic	−0.48*	–	0.52*	na	0.57*	na	0.47*
3 Bulletproof[a]	−0.27*	0.56*	–	na	0.36*	na	0.43*
4 Worth it	−0.18*	0.32*	0.29*	–	na	na	na
5 Jungle[a]	−0.26*	0.51*	0.32*	0.34*	–	na	0.32*
6 "Informed choice"	−0.05	0.07	0.07	0.19*	0.17*	–	na
7 "Low tar"	−0.23*	0.44*	0.46*	0.17*	0.25*	−0.02	–

[a] Five-item scales below diagonal, three-item scales above.
* $P < 0.01$.

We looked at sociodemographic differences in the four scales. There were strong increases in adherence to beliefs by age for all scales except "jungle" ["skeptic": $F(2,797) = 33.4$; "worth it": $F(2,680) = 7.6$; "bulletproof": $F(2,680) = 12.3$]. The less well educated were more likely to hold "skeptic" [$F(2,777) = 44.6$], "bullet proof" [$F(1,664) = 8.8$], and "jungle" beliefs [$F(1,164) = 16.6$], but there was no difference for "worth it" beliefs. There were also small gender differences, with men more likely to hold "bullet proof" beliefs [$F(1,683) = 4.6$, $P = 0.03$] and women more likely to hold "jungle " beliefs [$F(1,683) = 4.3$, $P = 0.04$], but no gender differences for the other two scales. In addition, "skeptic" and "worth it" beliefs were held more by those smoking over 15 cigarettes per day [$F(1,799) = 6.6$ and $F(1,682) = 4.8$, respectively].

Stepwise discriminant function analyses explored how these types of self-exempting beliefs interrelate in regard to progress towards cessation. Analyses were run separately for smokers only and for the whole sample, as some questions were not asked of recent quitters. For smokers only, we included the "knowledge" scale, the four self-exempting belief scales, and the two single items. Due to sociodemographic differences in adherence to self-exempting beliefs, we also included age, gender, and education as predictors. Both the "worth it" scale ($F = 35.9$) and the "knowledge" scale ($F = 9.5$) discriminated between the three smoker categories, but the "skeptic" scale did not. For the overall analysis, we used the shortened "bulletproof" and "jungle" scales, thereby excluding variables not asked of recent quitters. Overall, the "skeptic" belief scale and the knowledge scale had significant independent discriminative capacity to predict to which of the four intention to quit categories the respondent belonged ($F = 9.2$ and 4.1, respectively).

To better clarify the nature of the relationships, we conducted further discriminant function analyses on each contingent pair of intention to quit outcomes. Comparing precontemplators and contemplators, both "worth it" and "knowledge" contributed, with "skeptic"—which had a strong bivariate association—dropping out. Comparing contemplators and preparers, nothing was significant. Comparing preparers and recent quitters only the "bulletproof" scale was significant ($F = 5.8$). It is notable that "jungle" had almost an equivalent bivariate relationship, but following the inclusion of "bulletproof", it dropped below significance.

Discussion

The results of this study show that all four types of self-exempting beliefs are related to interest in quitting, but suggest that some types of self-exempting beliefs are more important than others in influencing progression towards cessation. Furthermore, the beliefs (or sets of beliefs) play largely independent roles in inhibiting cessation. The intuitively plausible hypothesis that the beliefs function as a form of armory: the more beliefs to which you subscribe, the more protected you are, is largely disconfirmed by the results. In each multivariate analysis where an effect was found, only one of the self-exempting belief scales had independent predictive value for progress towards quitting.

In what follows the discussion should be thought of as theorizing grounded in the results, rather than as empirical findings from the study. While cross-sectional analyses can sometimes rule out hypotheses, it is acknowledged that they can never provide strong evidence for hypotheses. Nonetheless, if thinking is to progress, we need to develop testable theories to be evaluated in subsequent research.

Progress towards quitting can be usefully conceived of as a chain of three key events: a decision to engage with the issue (the transition from precontemplation to contemplation), a decision to act (contemplation to preparation), and the enacting of the decision (preparation to action). The variables most closely related to engagement were the "knowledge" and "worth it" scales. Higher knowledge and lower perceptions of smoking being worth it were associated with being in contemplation. These findings are consistent with earlier studies [16–18] that show the perceived disadvantages of smoking are higher in contemplators than in precontemplators. "Worth it" beliefs, which are essentially a person's personal cost–benefit appraisal, must also be influenced by appraisal of harms, but also take into account experienced benefits of smoking. This might explain their independent predictive effect on progression toward quitting.

While most smokers may accept that smoking kills, many may have not been informed or may not understand

the magnitude of the problem: for example, that those quarter of long-term smokers who die from smoking-caused diseases in middle age (35–69 years) lose on average 22 years off the life expectancy of a nonsmoker [19]. There is clearly more creative work to be done in making the relative risks of smoking seem more salient to smokers. Interventions designed to make the harms more salient should both improve knowledge by making the facts more credible (or by introducing genuinely new facts), and by doing so, challenge ''skeptic'' beliefs directly in an attempt to change the balance of worth away from smoking. It is not surprising that knowledge was correlated with the ''skeptic'' scale. This scale is essentially about doubting the extent of the harms, something that is much easier in the absence of appropriate knowledge.

The importance of ''worth it'' beliefs in encouraging engagement with the issue of quitting suggests the potential utility of awareness campaigns that give extra emphasis to morbidity—to the drastic diminution of quality of life caused by smoking caused diseases such as emphysema—in addition to messages about premature death. This may be particularly pertinent for older smokers. Knowledge of the health risks of smoking was lower for older smokers, consistent with earlier studies [21,22]. Previous studies have shown that older smokers and many health professionals see few health benefits for long-term smokers giving up [20].

The lack of change in any of the self-exempting beliefs between contemplation and preparation suggests that they are not influential in the decision to act. Why might this be so? One possibility is that the beliefs are not deeply held; that is, smokers find them convenient excuses for avoiding the issue, but at some deep level, know that they probably will not withstand any rigorous scrutiny. Rather, they can be seen as psychological shields or talismans useful in avoiding the issue, but not as serious weapons to protect the person from the need to act when they are actively thinking about it. That said, it is possible that ''worth it'' beliefs are simply more potent among precontemplators because there is a small group of smokers who genuinely underestimate the risks. That knowledge is independently predictive at this stage but at no other is consistent with this alternative explanation. Fortunately, both explanations point to the need for better information being important, at least for precontemplators.

The ''jungle'' and ''bulletproof'' beliefs were most closely related to the enacting of the decision to quit (progression from preparation to action). It is notable that these beliefs were at very similar levels across the three smoker categories, suggesting that the differences in responding may be a response to having quit, rather than a determinant of quitting. ''Bulletproof'' beliefs are beliefs that there is something about me that means I will be less likely to be affected, or that the risk can be avoided, while ''jungle'' beliefs are about the inherent dangers of living. Conceptually, both might be expected to play a role earlier, that is, in driving consideration of quitting. Longitudinal studies would be required to test this surmise. It is notable that even though the two scales are only moderately correlated, they seem to have the same relationship with quitting.

The general lack of relationship between ''bulletproof'' beliefs and the early stages of intention to quit is counter-intuitive and suggests that these sorts of beliefs may be less powerful in seeding active rationalization than might be thought. Stories about potential cancer cures and about differing personal vulnerabilities may not have as much adverse affect on motivations to quit as some might fear. A similar argument applies for ''jungle'' beliefs. It would appear that arguments about everything being dangerous are not really influential in decision making.

The role of the two stand-alone items warrants some comment. The belief that low tar cigarettes are not dangerous is not widely held. However, Shiffman et al. [23] have shown that many smokers feel the statement is true, even though they know the right answer when questioned. Smokers use the sensory cues that such cigarettes taste weaker and the information that they contain less tar to infer some potential benefit. At the same time, they know what they have been told by health experts, so know the correct answer to give when asked. Thus, if you ask the question in a way that taps their intuitions, you get much higher rates of belief than if you tap their propositional knowledge. This analysis is consistent with the main finding that emerges from this study: that many smokers like to think their smoking is not really dangerous, but at some level, realize this is an unsustainable position, easily eroded by facts. Shiffman's work is consistent with the argument that much of the reason for this is that smoking does not feel dangerous, thus making it relatively easy for smokers to sustain an ongoing pretence that their smoking is benign. The tobacco industry understands this ambivalence and has actively attempted to feed it via smoker reassurance [24,25].

Older and less well-educated smokers were more likely to hold beliefs, which have the potential to reduce the impact of quit messages, perhaps because they are less well informed about the harms. Many of this age group would have commenced smoking between 1950 and 1970, when acceptance of smoking was at its peak and smokers were the target of heavy advertising and public relations campaigns by the tobacco industry. In Australia, the tobacco industry and its consultants actively promoted the view in the news media that diseases like lung cancer were erroneously attributed to smoking, and were caused by air pollution [26]. Nearly one in four of the smokers in this study agreed that ''More lung cancer is caused by such things as air pollution, petrol, and diesel than smoking''.

For the past decade, the tobacco industry has rarely appeared in the news media in Australia, thus radically decreasing the circulation of such statements. The significantly lower prevalence of agreement with these beliefs in the younger age groups in this study may therefore be a positive reflection of reductions in such misinformation.

The focus of recent quit campaigns in Australia has been on younger smokers; it may be that older smokers need targeted campaigns, which address their belief deficits.

In conclusion, self-exempting beliefs seem to act as shields against facing the reality of the net harms caused to most smokers by their habits. These beliefs may make it easier for smokers to disengage from the task most know they should confront, quitting their life threatening habit. In attempting to remedy this situation, the focus needs to be on older, less well-educated smokers, that is, those most likely to be continuing to delude themselves, or in some cases, who remain truly underinformed.

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